REMARKS

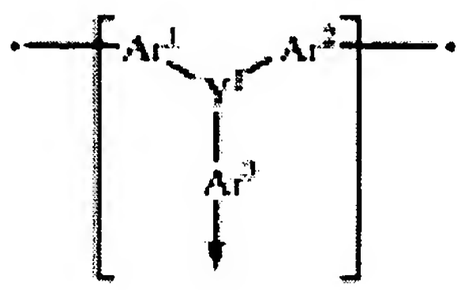
Rejection of Claims 24-30, 41-44 and 47 under 35 U.S.C. §102(b)/103(a)

Claims 24-30, 41-44 and 47 have been rejected under 35 U.S.C. §102(b) as anticipated by, or in the alternative, under 35 U.S.C. 103(a) as obvious over WO 99/32537, whose English language equivalent, US Patent No. 6, 630, 566, is referred to hereinafter as "Allen".

Examiner's Rejection

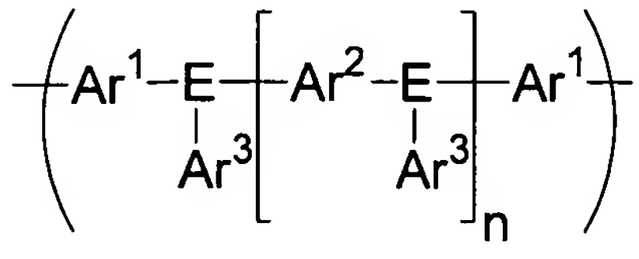
The Examiner stated[1]:

> Allen discloses a polymeric material comprising of at least one repeating unit, or each of more than one repeating unit consisting of Formula (1) wherein Y^1 may be **N, P**, S, As and/or Se and Ar^1, Ar^2 and Ar^3 may be aromatic groups (Abstract; Col. 12, lines 27-63) selected from phenylene and naphthenyl (Col. 16, lines 35-43).



Formula 1

The Examiner stated[2] that the repeating unit of Allen, when Y^1 is a phosphorous atom, falls within the scope of the first repeat unit of the claimed Formula (I), reproduced below, when E is a phosphorous atom, each Ar^1 and Ar^3 is a phenylene and n is zero.



Formula (I)

The Examiner further stated[3] that when the value of Y^1 of the second repeating unit of Allen is a nitrogen atom, the second repeat unit of Allen falls within the scope of the second

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[1] Office Action of August 7, 2009, paragraph bridging page 4 and 5, section 8.
[2] Office Action of August 7, 2009, page 5, section 8.
[3] *Ibid.*

repeat unit of the claimed Formula (I), wherein E is a nitrogen atom, each Ar^1 and Ar^3 is phenylene and n is zero.

The Examiner concluded[4] that when the polymeric material of Allen contains more than one repeating unit with one unit containing a phosphorous atom and the other repeating unit containing a nitrogen atom, such polymeric material is "readable on" (*i.e.*, falls within the scope of) the claimed polymer as recited in Claims 24-30 and 47. The Examiner further stated[5] that Allen discloses that its polymeric material may be used in optical devices, such as electroluminescent devices, and switching devices, such as transistors, as recited in the Claims 41-44 (column 14, lines 6-44).

The Examiner stated[6] that if Allen's disclosure is deemed insufficient to anticipate Claims 24-30, 41-44 and 47, it would have nonetheless been obvious to one of ordinary skill to produce the claimed oligomer or polymer after reading Allen's disclosure.

Applicants' Response

Applicants respectfully disagree with the Examiner's statements. The Examiner's attention is drawn to the fact that beyond the generic disclosure in Abstract and column 12, lines 27-63, Allen does not provide any specific examples of compounds of the above-identified Formula 1, where Y^1 is a phosphorous atom. Not only is the value of phosphorous only one of five possible values for Y^1 in Allen's generic disclosure, but also not one of the thirty-two examples disclosed in column 34 through column 66 of Allen includes a phosphorus atom as the value of Y^1. Thus, Allen provides no reason or motivation to select phosphorous over any other of five possible values for Y^1. In contrast, independent Claims 24 and 47 require that at least one E in Formula (I) be a phosphorus atom. Accordingly, the materials defined by pending Claims 24 and 47 are selection inventions with respect to the generic disclosure of Allen.

Furthermore, the Examiner's attention is drawn to the fact that the material claimed in the instant Claims 24 and 47 is an oligomer or polymer rather than a single repeat unit. Therefore, in order to arrive at the oligomer or polymer defined by instant Claims 24 and 47, more than one selection of the value of Y^1 needs to be made. In case of the simplest oligomer, the one with

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[4] *Ibid.*
[5] *Ibid.*
[6] Office Action of August 7, 2009, second paragraph, page 6, section 8.

only two repeat units present, one Y^1 would need to be selected to be a phosphorous atom from five possible values for Y^1, and the other Y^1 would need to be selected from two permitted values out of five possible values for Y^1 (either phosphorous or nitrogen). Thus, four out of twenty five possible combinations would need to be selected in order to arrive at the two-unit oligomer as defined in Claims 24 or 47. As the number of units in the polymer of Claims 24 and 47 increases, the number of possible combinations increases as well. For example, for an oligomer having three repeat units, twelve out of one hundred and twenty five possible combinations would need to be selected in order to arrive at the two-unit oligomer as defined in Claims 24 or 47. In other words, the fraction of the "favorable" combinations (*i.e.* selections of values of variable Y^1 permitted by the definitions in Claims 24 and 47) falls as a power of number of repeat units. Thus, without some teaching or suggestion, one of ordinary skill in the art would not select the values of variable Y^1 that are required by Claims 24 and 47 out of all possible values described in Allen. Further, one of ordinary skill in the art would not be motivated, based on the teachings of Allen to make the selection of variables claimed by Applicants.

Moreover, selecting phosphorous as an atom at a position E in Formula (I) of the instant application provides unexpected and numerous advantages over polymers that only include a nitrogen, as employed in all of the examples of Allen. Specifically, as stated on page 14, lines 3-15 of the English translation of the instant application:

> The present inventors have identified numerous advantages of the polymers according to the invention as compared to prior art amine-containing polymers, as follows : The polymers according to the invention have a significantly larger HOMO-LUMO bandgap (Eg) than comparative polymer not containing repeating units according to formula (I) (compare Table 1 below). Furthermore, the polymers according to the invention have bluer 1931 PAL CIE co-ordinates for both photoluminescence (PL) and electroluminescence (EL) (compare Table 2 below).
>
> In addition, the present inventors have found that a small red peak is observed in the electroluminescent spectrum of several amine-containing polymers. In contrast, this peak is absent in the electroluminescent spectra of polymers according to the invention.

Other advantages of the phosphines according to the invention over prior art amines are higher external quantum efficiency and current ca. 2.5 times higher for polymers according to the invention.

In summary, the materials defined by Claims 24 and 47 are a novel selection over the cited references. This novel selection provides these materials with advantageous and unexpected properties.

In view of all of the above, independent Claims 24 and 47 are novel and non-obvious over Allen. Furthermore, Claims 25-30 and 41-43 depend directly or indirectly from independent Claim 24 and, therefore, are also novel and non-obvious over Allen.

Reconsideration and withdrawal of the rejection under 35 U.S.C. §102(b), or in alternative, 35 U.S.C. §103(a), are respectfully requested.

CONCLUSION

In view of the above amendments and remarks, it is believed that all claims are in condition for allowance, and it is respectfully requested that the application be passed to issue. If the Examiner feels that a telephone conference would expedite prosecution of this case, the Examiner is invited to call the undersigned.

Respectfully submitted,

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